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EXAMINER

NOLAN, DANIEL A

ART UNIT PAPER NUMBER

2654

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Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

**Application No.**

09/581,408

**Applicant(s)**

CLASS ET AL.

**Examiner**

Daniel A. Nolan

**Art Unit**

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11, 12, 14-17, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 13 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The listing of references in the specification (4<sup>th</sup> paragraph 1<sup>st</sup> page, paragraphs 1-2 page 5) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested:

Voice Recognition using a Grammar or N-Gram Procedures.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Kita et al**

4. Claims 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kita et al ("Incorporating LR Parsing Into SPHINX", International Conference on Acoustics, Speech & Signal Processing, April 1991).

5. Regarding claim 11, Kita et al, with the teaching to *integrate LR natural language parser with the SPHINX<sup>®</sup> speech recognition system to provide more global grammatical constraints combining context-free grammar with bigram grammar* reads on the invention *for recognizing speech from a word (or sound) sequence* as follows:

- Kita et al reads on the feature of *applying a 1<sup>st</sup> recognition procedure to a 1<sup>st</sup> segment of the word (or sound) sequence, the 1<sup>st</sup> segment including a plurality of 1<sup>st</sup> words (or sounds) with the SPHINX<sup>®</sup> processing* (Abstract, 10<sup>th</sup> line page 269).
- Kita et al reads on the feature of *applying a 2<sup>nd</sup> recognition procedure to a 2<sup>nd</sup> segment of the word (or sound) sequence, the 2<sup>nd</sup> segment including a plurality of 2<sup>nd</sup> words (or sounds) with the LR parsing* (last paragraph page 269 – see Abstract, 10<sup>th</sup> line);

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- Kita et al reads on the feature of *combining a last two words (or sounds) of the plurality of 1<sup>st</sup> words (or sounds) into a pseudoword (or sound) upon a change from the 1<sup>st</sup> recognition procedure to the 2<sup>nd</sup> recognition procedure and processing the pseudoword (or sound) using a digram detection method (the bigram grammar of the 3<sup>rd</sup> line from end last paragraph page 269).*

6. Regarding claim 14, the claim is set forth with the same limits as claim 11. Kita et al reads on the feature where *at least one of the 1<sup>st</sup> and 2<sup>nd</sup> segments is predefined in terms of at least one of a respective segment length and segment position (inherent in the operation of the LR processor, last 2 paragraphs of section 2.1 page 270).*

7. Regarding claim 15, the claim is set forth with the same limits as claim 14. Kita et al reads on the feature where *at least one of the 1<sup>st</sup> and 2<sup>nd</sup> segments is permanently allocated to one of the 1<sup>st</sup> and the 2<sup>nd</sup> recognition procedure (with the processing constantly being initiated using the SPHINX-LR II method (last paragraph page 271).*

8. Regarding claims 16 and 17, the claims are set forth with the same limits as claims 14 and 11, respectively. Kita et al reads on the feature where *the 1<sup>st</sup> segment has a predefined length and is positioned at a beginning of the word (or sound) sequence (with the teaching that the SPHINX<sup>®</sup> uses a word-pair from the beginning, 2<sup>nd</sup> paragraph section 2.1 page 270).*

**Meteer et al**

9. Claims 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Meteer et al ("Statistical Language Modeling Combining N-Gram And Context-Free Grammars", IEEE International Conference on Acoustics, Speech & Signal Processing, April 1993).

10. Regarding claim 11, Meteer et al, with the teaching that combining *partial-coverage phrase structure grammar with statistical n-gram techniques make a robust statistical grammar which explicitly incorporates linguistic and semantic structure reads on the invention for recognizing speech from a word (or sound) sequence* as follows:

- Meteer et al reads on the feature of *applying a 1<sup>st</sup> recognition procedure to a 1<sup>st</sup> segment of the word (or sound) sequence, the 1<sup>st</sup> segment including a plurality of 1<sup>st</sup> words (or sounds) with the recognition grammar* (last paragraph, page II-37).
- Meteer et al reads on the feature of *applying a 2<sup>nd</sup> recognition procedure to a 2<sup>nd</sup> segment of the word (or sound) sequence, the 2<sup>nd</sup> segment including a plurality of 2<sup>nd</sup> words (or sounds) with the N-Grams* (1<sup>st</sup> paragraph page II-39);
- Meteer et al reads on the feature of *combining a last two words (or sounds) of the plurality of 1<sup>st</sup> words (or sounds) into a pseudoword (or sound) upon a change from the 1<sup>st</sup> recognition procedure to the 2<sup>nd</sup> recognition procedure and processing the pseudoword (or sound) using a digram detection method* (included in the *n-gram* combined with the *phrase-structure models* in the 2<sup>nd</sup> paragraph right column page II-40).

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11. Regarding claim 12, the claim is set forth with the same limits as claim 11.

Meteer et al reads on the feature where *the 1<sup>st</sup> recognition procedure includes an integrated unique syntax procedure and the 2<sup>nd</sup> recognition procedure includes a statistical word (or sound) sequence procedure* (lines 21-23, right column page II-40).

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Kita et al & Nakadai et al**

14. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being obvious over Kita et al in view of Nakadai et al (U.S. Patent 5,732,394 A).

15. Regarding claim 19, the claim is set forth with the same limits as claim 11. Kita et al changes methods based on *failure*, so does not change on *recognition*. Nakadai et al, with the invention *for word speech recognition by pattern matching*, reads on the feature where *a change from the 2<sup>nd</sup> recognition procedure to the 1<sup>st</sup> recognition procedure is performed based on a respective word (or sound) detection or phrase detection* (S43 in figure 8 – see column 14 lines 1-5). It would have been obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the method/teachings of Nakadai et al to the device/method of Kita et al to process each segment using the methods that are likely to result in recognition.

16. Regarding claim 20, the claim is set forth with the same limits as claim 19. Kita et al reads on the feature where *the 2<sup>nd</sup> recognition procedure is used as standard* with the teaching that if at some point during recognition the system fails, then the system will use the bigram paths (from last paragraph of page 271 to 1<sup>st</sup> paragraph page 272).



***Allowable Subject Matter***

17. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter:

- The present invention is directed to *recognizing with two methods for accuracy*.
- Regarding claim 13, the closest prior art of Kita et al teaches where *the 1<sup>st</sup> recognition procedure is a digram recognition procedure* (i.e. *bigram* in line 13 page 270) *limited to permissible series* (line 14 page 270) without specifying that the 2<sup>nd</sup> recognition procedure is *trigram*. The close prior art of Meteer et al teaches that the *n-gram* may be combined with statistical, but does not stipulate that it be *tri-gram*.

Because processing n-grams includes 2- and 3-segment words together with tri-grams, any method dealing with one to the exclusion of the other is a matter of preference over method, processing one over other for speed or accuracy.

Consequently, the features that *the 1<sup>st</sup> recognition procedure is a digram and the 2<sup>nd</sup> recognition procedure is a trigram* recognition procedure is neither anticipated nor is it found in obvious combination in the prior art of record.

- Claim 18 depends from a claim that was found to be allowable and so is allowable as a consequence.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Iso (Japan Patent 01-177600 A) voice recognition error correcting device segments predefined lengths from given positions.
- IBM (IBM Technical Disclosure Bulletin NN91067) speech recognition with HMM of speech waveforms for fixed-length segments from given positions.
- Gauvain *et al* ("The LIMSI Continuous Speech Dictation System: Evaluation On The ARPA Wall Street Journal Task". IEEE International Conference on Acoustics, Speech, and Signal Processing, April 1994) CSR use of continuous density HMM with Gaussian mixture for acoustic modeling and n-gram statistics estimate for language modeling.
- Costagliola *et al* ("Visual Language Editors Based On LR Parsing Techniques", ©2000) combines the LR-based techniques for parsing visual languages with incremental Generalized LR parsing techniques developed for string languages.
- Ney (U.S. Patent 5,005,203 A) recognizing continuous speech using two processors.
- Kawai *et al* (U.S. Patent 5,878,390 A) speech recognition equipped with means for removing erroneous candidate of speech recognition.
- Eman *et al* (U.S. Patent Publication 2002/0099543 A1) segmentation technique increasing the active vocabulary of speech recognizers.

20. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Daniel A. Nolan at telephone (703) 305-1368 whose normal business hours are Mon, Tue, Thu & Fri, from 7 AM to 5 PM.

If attempts to contact the examiner by telephone are unsuccessful, supervisor Richemond Dorvil can be reached at (703)305-9645.

The fax phone number for Technology Center 2600 is (703)872-9314. Label informal and draft communications as "DRAFT" or "PROPOSED", & designate formal communications as "EXPEDITED PROCEDURE". Formal response to this action may be faxed according to the above instructions,

or mailed to: P.O. Box 1450  
Alexandria, VA 22313-1450

or hand-deliver to: Crystal Park 2,  
2121 Crystal Drive, Arlington, VA,  
Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Technology Center 2600 Customer Service Office at telephone number (703) 306-0377.

Daniel A. Nolan  
Examiner  
Art Unit 2654

DAN/d  
July 5, 2004



**RICHEMOND DORVIL**  
**SUPERVISORY PATENT EXAMINER**